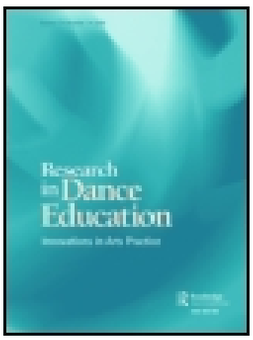
Is the health risk and consequence of generalised joint hypermobility understood within a classical ballet narrative? Concerns for dance practitioners



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Is the health risk and consequence of generalised joint hypermobility understood within a classical ballet narrative? Concerns for dance practitioners

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ABSTRACT

Generalised Joint Hypermobility (GJH) is a heritable disorder of the connective tissue that manifests as extreme range of motion in the joints; it is considered both an asset and health risk to the dancer. Recently, links between GJH, anxiety, emotional and mental well-being have been established. The experiences of GJH in professional dance artists (five male, four female; mean age = 32.3 yrs; range = 25–40 yrs) and Ballet masters (3 female & 1 male, mean experience 30.8 yrs.) were exploredthrough semi-structured interviews (45-60 min). A biopsychosocial filter and qualitative reflective thematic approach were appliedto the analysis. Emerging themes include; hypermobile aesthetic, professional values and preconceptions, choreographic trends, company strategies, intellectual curiosity, pedagogy and leadership. Participants agreed dancers with GJH characteristics met the direction and desired aesthetic for today's dance companies and choreographers. They showed a good understanding of the strengths and challenges of GJH but did not directly associate any psychosocial traits . The findings demonstrate that whilst commonly exploited for choreographic gains, the health risks and experience of GJH are not understood in the professional dance environment. Finally, we translate the practical implications of our findings for teaching dance in developmental environments.

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Classical-ballet; biopsychosocial; dance-master; hypermobility; flexibility; health-risk; well-being

Background

Central to this exploration is a developmental understanding of the classical ballet environment. Ballet is a highly codified form of dance that developed in the renaissance period (14th–17th centuries) predominantly through the work of professional Ballet masters who were teachers, choreographers and social arbitrators *par excellence* designing codified techniques to expose the dancer as an athlete with supernatural powers (Guest 1962). As ballet developed, so did the physical demands on the dancer. For example, the ability to appear as if airborne by dancing on the tip-toes once only required by female soloists quickly became fundamental in ballet technique enabling the boundaries of the art form to be pushed, providing spectacle to their audiences (Lee 2002).

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Thus, ballet masters and choreographers keep traditions yet they also design progressive-ballet practices of the future. Today, feminist scholars warn against classical ballet virtuosity and an over-investment in specific body types (Foster 1997; Pickard 2013; Ritenburg 2010), warning against stereotypes and dancer body image disturbance (Ravaldi et al. 2006, 2003) that often prevails in neo-classical choreography with gender-neutral androgynous body-types. The success of today's dancer, independent of gender, appears for the main, to meet and embody a 'ballet aesthetic of beauty and perfection' (Pickard 2015, 7) that is increasingly one that can facilitate extensions and gestures of the limbs that go beyond normative physical bounds. Short tutus, figure hugging unitards and bright lights assist to reveal a slender body aesthetic and limbs in full gesture replacing earlier modest costumes and stagecraft of the nineteenth century. In such, the requirement for a dancer's body to articulate movement in excess is normalised with hypermobile joints an increasingly predominant feature within the modern ballet arena (Chan et al. 2018a; Day, Koutedakis, and Wyon 2011; Ruemper and Watkins 2012; Sanches et al. 2015a).

Hypermobility in the joints is either inherent *or* acquired; distinct and with important differences for dance, yet similarities across inherent and acquired types also means that they can be confused (Malfait et al. 2017). Acquired hypermobility in the joints is protected from injury and instability by 'normal' tissue so long as flexibility training does not violate the tissue, whereas inherent hypermobility results from inherited genetic variance that presents as 'abnormal' and fragile connective tissue (Bloom et al. 2017; Syx et al. 2017). The fragile tissue associated with inherent joint hypermobility does not have protective properties and is vulnerable to injury when over-used or over-extended in dance activities (Castori et al. 2017; Keer and Grahame 2003). Inherent joint hypermobility presents as variants within the hypermobility spectrum disorder (HSD) and these are; generalised (GJH), localised (LJH), peripheral (PJH) or historical (HJH) (Castori et al. 2017). LJH is limited to three joints and PJH is limited to the hands and feet whereas GJH and HJH (interrelated with GJH in that it has the same features however it is

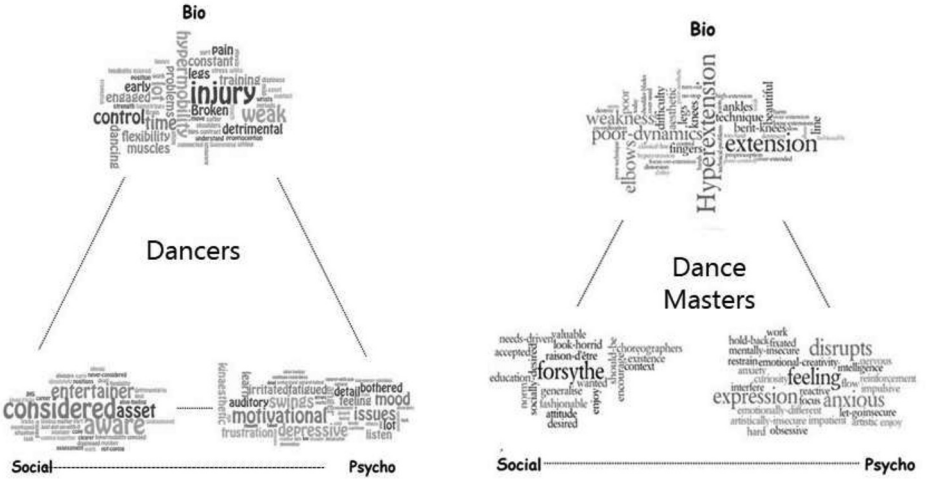

Figure 1. Word cloud representations of the data.

observed historically) affect both the limbs and axial skeleton and are therefore predominantly misconstrued as an augmented 'asset' and signposted to dance technique (Chan et al. 2018a). GJH can be asymptomatic; however, it can cause problems within the musculoskeletal system (Castori et al. 2017; Marco Castori and Colombi 2015; Keer and Grahame 2003) that can occur at developmental stages that are critical to dance training (e.g. during adolescent growth spurts) (Adib et al. 2005; Ghibellini, Brancati, and Castori 2015; Maillard and Pilkington 2016). The estimation for GJH prevalence is challenging because it is not typically screened for and only registers within health reporting systems when something within the musculoskeletal system fails or becomes problematic (Remvig et al. 2011). Beighton et al, (1973) propose screening criteria for GJH observing passive ranges of motion in the joints (Keer and Grahame 2003). Reporting of GJH is however also influenced by lifespan development, maturation and injury as all of these can temporarily change the range of motion the joints (Juul-kristensen et al. 2018; Remvig, Jensen, and Ward 2007; Lars Remvig et al. 2011). Adult screening criteria and method for GJH uses a simple reliable and reproducible questionnaire for detecting hypermobility (Hakim and Grahame 2003; Mulvey et al. 2013) that also mitigates for maturation influences as the assessment criteria can be applied retrospectively. This method provided an estimate of 18% GJH prevalence in a general population of 46,000 (Junge et al. 2019) and it is this method of observation for GJH that was applied in the present research.

Current progressive choreography and performance demands define that the dancer's physique is equally as important as skill and technical development (which includes aesthetic abilities). Today, strength and flexibility are indeed the two most sought after features in elite ballet dancers (McCormack et al. 2019). It is not surprising or unpredictable that the prevalence of GJH in professional ballet is reported as high as 89% and 90% (Chan et al. 2018a; Moira McCormack et al. 2004) which is over four times the general average as reported by Jung et al. in 2019. This suggests GJH signposting towards a career in professional dance, yet worryingly, we know that when GJH is not understood or respected by practitioners it can become a mechanism for physical injury in dance (Ekegren, Quested, and Brodrick 2014; Micheli et al. 2017; Mitchell et al. 2016; Morris et al. 2017; Yau et al. 2017). Unquestionably, GJH enables extreme ranges of motion allowing dancers to effortlessly lift legs higher, contort spines in all directions and hyperextend ankles to meet a desired (and often choreographically required) aesthetic (see, for example, choreographic works such as *Duo* by Forsythe 1996, *Push* by Maliphante 2009). Controversially, industry demands influence dance students in training as they struggle to emulate seasoned professionals, such as Sylvie Guillem, who undeniably carries the genetic signature of GJH (Potter 2018). An inherent phenomenon perhaps, nevertheless flexibility can arguably also be acquired through hard work and effort (Malfait et al. 2017). Sadly, 'naturally occurring' or inherent hypermobility is more immediate, clearly 'valued' over hard work, and considered as an asset (Foley and Bird 2013) and this makes inherently hypermobile young dancers appear 'full of potential' (McCormack 2010, 5)

More recently, the clinical literature (Carolina Baeza-Velasco et al. 2017; Carolina2018b; Sanches et al. 2015a, 2015b) suggests a fragility and vulnerability within GJH that goes beyond dancer physique. There are now clear indications that indirectly link GJH with psychosocial individualities which are characterised as a 'different neuro-

connective phenotype' (Baeza-Velasco et al. 2018b). In such those with GJH can also present with panic disorder, dysautonomia, emotional and psychological sensitivity, anxiety and depression, the mechanisms for which are currently neither defined nor really understood (Baeza-Velasco, Grahame, and Bravo 2017; Bulbena et al. 2017; Sanches et al., 2015a). Disturbingly, within the classical ballet context where GJH is predominant, increased anxiety may also amplify the risk of career threatening injury (Ford et al. 2017; Scheper et al. 2013). It could also exacerbate pain perception during training or post injury, intensifying levels of fear of re-injury, pain-related anxiety and avoidance behaviours that also lead to poor rehabilitation outcomes (Ford et al. 2017; Walker and Nordin-Bates 2010). Indeed, the association between pain sensation and GJH is clearly reported in the literature, yet GJH remains commonly overlooked as a cause for chronic pain and GJH is often totally disregarded as a factor within pain sensitivity in dancers and gymnasts because it is seen as an asset (Kumar and Lenert 2017).

Although this literature is still evolving, it appears that the musculoskeletal asset/liability prospects for a dancer with GJH are also entangled with altered neuro-connectivity and psychosocial factors. Therefore, as practitioners, with this research we wanted to investigate and understand the implications of GJH within professional dance practice. With this as our focus, we designed a qualitative study to explore the experience and phenomenon of GJH in the professional dance practice. The aim of our study was to investigate what dancers and Ballet masters know and understand about GJH within their dance practice.

Methods

The reviewed literature suggests that a dancer with inherent GJH potentially has tissue and psychological fragility that could present as a health risk. Risk reduction strategies within health are well developed by the World Health Organization's (WHO) through Engel's bio-psycho-social model of functioning (Engel 1977; WHO 2001). Using this model, we were able to filter the embodied physical, experiential, psychological, social and cultural aspects of GJH within the classical ballet context. This in turn enabled us to explore the health risk and implications of GJH within dance practice.

As such, the reality of GJH is lived by dancers who present with it but those who work with them (e.g. ballet masters) also experience it either directly and/or indirectly as an observer. Sensory and kinetic experiences such as dance and in particular with reference to the experience of one's own body can be approached using phenomenology (Sheets-Johnstone 1990, 358). Whilst objective phenomenology could reveal for us information about the physiognomy and appearance of the hypermobile body, hermeneutic phenomenology focuses more on individual subjective experiences by exposing the 'lived' environment (Kafle 2013). For this reason, we took a hermeneutic approach in the present study to expose accounts and life-world/dance environment stories of dancers and Ballet masters (Kafle 2013). Within this context, we defined understanding as an abstract process of the mind and brain that exists in varying degrees and in different modes (Kelp 2015) and we argue that knowledge comes in many Polanyian shapes and forms that can be described as explicit, implicit and tacit (Boshoff 2014). In terms of unravelling their experience of GJH, we therefore considered the depth of their understanding via explicit 'knowing that' and tacit knowledge gained from personal experience or 'knowing

how'. To this extent, 'knowing that' focused on the musculoskeletal (bio) and psychosocial characteristics of dancers with GJH in the context of explicit ballet skills (dance technique, vocabulary, repertoire and choreography). Correspondingly, the tacit understanding of 'knowing-how' explored how aesthetic expression and emotional communication were experienced through the dancer's hypermobile body and within a performance environment (Markula 2017; Polanyi 1966).

Design

An interpretive heuristic phenomenological approach and a biopsychosocial lens were used to explore and appreciate the experience of GJH within the professional dance environment. The study complied with the University of Edinburgh's research ethics and integrity requirements. We developed interview guides based on current peer reviewed and available 'grey' literature to reflect the most up-to-date understanding of GJH as it was important to determine potential common themes that might triangulate information shared with us by the Ballet masters and dancers. The interviews shared some common or similar questions across the dancers and Ballet masters that enabled us to gather confirmatory data from the participants, including demographic and descriptive data. In addition, exploratory open-ended interview questions were used to gather ontological and epistemological information (Saldaña 2014). For example, we designed some questions to capture the opinions of the Ballet masters and dancers concerning the ontological reality of hypermobility in the teaching and learning environment, whereas we designed other questions to capture the participants' epistemological understanding of the phenomenon of hypermobility in the dance environment. Prompts for recall of events (some retrospective) were also used to put the information shared into context. This also helped the participants remember as much information as possible from a personal life-world 'dance practice' perspective (Côté, Ericsson, and Law 2005; Kafle 2013). We piloted and refined the interview guides before use on two professional female dancers with over 7 years of experience working in dance companies internationally and one very experienced dance master who had worked with several major ballet companies and was at the time of the interview working as a freelance dance master internationally. The main edits to the guide concerned avoiding clinical terminology and vocabulary by applying laypersons language and descriptions, for example the umbrella term 'hypermobility' was used in discussions as opposed to generalised joint hypermobility (GJH). Based on the participant's experience as dancers and dance masters, our research enquiry asked, what is the knowledge of GJH in the professional dance environment? In addition, based on the participant's narratives, what can we learn about their understanding of GJH?

Participants

Purposive sampling methods (Robson 2011, 149) following inclusion criteria and snowballing techniques with two entrance points were adopted for each participant group recruitment (Malterud, Siersma, and Guassora 2016; Vasileiou et al. 2018). For us, exposing the understanding and beliefs of the participants regarding GJH was critical. Therefore, we approached experienced dancers and practitioners for interview. This gave

information power to the data we collected and meant that a relatively low number of participants was suitable for the study (Malterud, Siersma, and Guassora 2016).

Dancers

Inclusion criteria for the dancers were: referral to the study because of their extreme flexibility by clinical or dance practitioners working closely with them, at least ten years technical training in classical ballet, and performance experience in a national level dance company. Recruitment took place on a voluntary basis and written consent was obtained from all participants in advance of taking part. We interviewed nine dancers; their mean age was 32.3 yrs. (SD = 4.99, Range = 25–40 yrs). Five were male, mean age 32.8 yrs. (SD = 5.19, Range = 27–40 yrs) and four female, mean age 31.75 yrs. (SD = 4.66, Range = 25–38 yrs). The mean age for starting dance classes for the group was 7.56 yrs. (SD = 3.5, Range 4–14 yrs) with the female dancers starting on average 5.5 years younger than the male dancers which is consistent with common practice in dance and in particular classical ballet (Weiss, Shah, & Burchette, 2008). The dancers had a mean of 11.89 yrs. (SD 3.92) professional performance experience in a company, which ranged from 6 to 18 years. Eight out of the nine had training in contemporary dance in addition to the required ten years (or more) classical ballet training. Seven out of the group worked and performed in the classical ballet and neo-classical dance genre, two were currently contemporary dancers and one worked in the commercial field. Interestingly, four out of the group had initially started training in gymnastics at a very early age (between 4 and 7 yrs.) These four dancers were encouraged/selected into gymnastics because of their flexibility. One of the dancers had signposted a talented tennis player at an early age. All the dancers in the group presented with GJH according to the ≥3 positive score criteria for self-screening (Bulbena et al. 2014). The mean scores on the self-reported screen (Bulbena et al. 2014) for the whole group were 7.79 (SD = 1.9, range 4–10). The female dancers however scored considerably higher, mean score = 9.25 (SD = 0.23, Range 9–10) than the male dancers, mean = 6.6 (SD = 2.04, Range = 4–9).

Ballet masters

Similarly, we approached the Ballet masters using snowballing methods for which the initial entry points were recommendations and electronic introductions from two ex-professional dance artists who were actively working in the field as dance practitioners (Malterud, Siersma, and Guassora 2016). Our criterion for sampling were: more than 10 years of experience and employment with a professional company at the time of data collection, and dance master status (teaching dancers in dance companies that perform master works in their repertoire) and performance experience in major dance companies. This provided assurance that the information gained would draw on the dance masters' extensive and immersive experience and would be powerful and in-depth. Four Ballet masters were interviewed in the study, three female and one male. They had a mean performance experience of 31 Yr. (SD = 6.48, range 25–38) and had all reached and exceeded soloist status during their careers. They had all performed nationally/internationally in acclaimed ballet companies that had over 30 dancers within the company and performed masterworks regularly in their repertoire. Their mean experience as a dance master was 19.25 Yr. (SD = 2.89, Range = 15–22) and they were all practicing as Ballet masters at the time of the interview.

Data collection

We scheduled the in-depth interviews at the participants' convenience and the first author conducted these virtually using a secure online platform. This helped us to capture and reflect the international scope of the study and the global reach of the participants. The interviews lasted between 45 and 60 min. We transcribed the interview audio files into word documents and made participant identity anonymous using pseudonyms. In order to ensure the trustworthiness and credibility of this process, a copy of each transcribed interview was sent to the interviewee to check for accuracy and once the text was agreed we deleted the audio files (Maxwell 1996, 87).

Data analysis

Initially, we collated the transcript texts for each group of participants and we manually filtered the dancer and dance master transcript verbatim into the three Bio-Psycho-Social categories that underpinned our research. Frequency calculations were made for each category; we then set parameters to generate word clouds with the most frequent words appearing as the largest (Figure 1. This approach allowed us to quickly visualise and get a feel for some of the general patterns in the text data (McNaught and Lam 2010) within the bio-psycho-social framework of our research. As research tools, word clouds do have certain limitations that we acknowledge. This is mainly that word frequency calculations, as opposed to considering the words within a context and meaning, are fundamental to the word cloud tool and it can be argued that it is more effective to consider the full text of each participant's interview (DePaolo and Wilkinson 2014; McNaught and Lam 2010).

We then probed the transcribed data further and analysed it using a thematic analysis approach (Braun and Clarke 2006). Specifically, we decided that reflexive thematic analysis (TA) was necessary as it emphasised the importance of our reflexive engagement with theory, data and interpretation (Braun and Clarke 2020). Reflexive TA enabled us to consider the data against a deductive/inductive continuum whereby we considered both the existing research and theory around GJH. This helped us identify, and articulate our reporting, using the phenomenological assumptions that informed our examination and analysis of the comments and opinions provided by the participants (Braun and Clarke 2020).

In this process, we read and re-read all of the interview transcripts several times in order to become very familiar with the contents. We carefully considered the features of the interview data alongside the research questions for both groups; we re-checked the dataset for each group to identify reoccurring features, themes (and sub themes). This enabled us to identify common narratives and opinions that addressed our investigation of what dancers and Ballet masters know and understand about GJH within their dance practice (Braun and Clarke 2019). The longer responses were rich in detail in both words and feelings as the participants expressed unique thoughts about the physical, emotional, and cognitive wellbeing experienced in the dance environment across both their careers and training. The retrospective reflection and exemplification helped them put things in to context and in this respect assisted the reflective TA. Some of the reoccurring features in the dancer's data included, time management, talent, physical and mental stillness, awareness, insecurity, being overwhelmed, not being understood and learning through

injury. The dance master data revealed features that included choreographic trends, company demands, media influences, training, repertoire demands, coping mechanisms, motivation, and injury.

Results and discussion

The word clouds for both the dancers and Ballet masters provided some evidence towards the participants' focus and perspective on GJH within the biopsychosocial context. The bio word cloud had marginally more volume than the psycho or social suggesting that this was at the centre of the participant's understanding. That said, the word clouds did not situate the evidence within any given context (McNaught and Lam 2010), nor did they suggest appreciation of the evidence they represent.

Reflective TA analysis

The codes' sub themes and themes that emerged from the data are presented below in Table 1

We now discuss the themes identified below for the dancers and Ballet masters.

The dancers

All dancers tested positive for GJH using the self-screen questionnaire (Bulbena et al. 2014; Hakim and Grahame 2003). Regardless of this, only one male dancer had received a clinical diagnosis for GJH in the past, and he had hypermobile type Ehlers Danlos Syndrome hEDS (Castori et al. 2017). Nevertheless, the dancers all had an explicit awareness of their flexibility, they referred to this as *'natural flexibility'* and '*double-jointedness'*. Six of the group believed *categorically* that this was an asset for a dancer, two considered it to be a liability, and one participant considered it to be both.

We identified two main themes associated with their experience and understanding of GJH; (1) O*penness to hypermobility* and (2) M*anaging hypermobility.*

Theme 1: openness towards hypermobility

Openness to '*natural'* flexibility and associated challenges differed across the group '[P]*ersonally, I don't believe that I was a flexible dancer'* (Ed), explained that his *natural* flexibility (including subluxations) only occurred in his upper body (shoulders and thoracic spine). The lack of evident knee, elbow, feet and ankle hyperextension and his (un)remarkable turn out made him conclude that he did not have GJH or as he described '*at least not in the right way for a dancer*'. This consensus was common, the dancers tended to compare their own 'degree' of flexibility with other dancers that were visibly hyperextended and could achieve extreme extensions and rotation with the legs and hips. Ron, was the only dancer with a clinical diagnosis (hEDS) when young, he was open to it and aware, " *My* [physical]tr*aining recognised and accounted for my hypermobility which enabled me to get lots of dance jobs that I might not have otherwise and I could afford to have a great life in Europe'*. Elsi reflectively sensed the health risk, (e.g., '[I)t *was a blessing that I did not stay with one particular company or choreographer for a long period of time')* saying that her extra flexibility over time '*may have been exploited*'. Despite this, she self-

Table 1. Reflective TA process.

Codes	Sub themes	Themes
	Dancer data	
Insecurity Overthinking JHS, degrees of Injury Aesthetic to be admired Learning styles	Understanding of hypermobility and awareness of the positive and negative associations	Understanding and Openness to GJH
Time Stillness Routine Chaos/ Confusion Rhythm Determination	Coping strategies	Managing GJH
	Dance master data	
Trends Choreographic Beauty	Taste	Aesthetic
Social media Funding Technical training	Driven by current cultural strategy *Mise-en-scène*	
Technique Emotion Resillience Passion Intelligence Injury Coping	Intellectual curiosity/thinking dancers	Professional values and preconceptions
Teaching & learning Technical training Trust Cultural shift	Pedagogical beliefs and leadership	

blamed putting her injurious career down to her own lack of stamina and fatigue yet not associating this with GJH. Gill believed that extreme flexibility was *'mostly an asset . . . '* which at times *'really hindered* [her] *development'* she discussed difficulties with parts of her body that *'did not fire up quickly'*. She also described how she *'over-indulged in the* [excessive] *movement and went further'* demonstrating decadently the extreme position. Only after she had climbed the ranks, Gill self-diagnosed that she had *'more collagen'* in her body and this stopped her getting strong and technically fast, giving her *'a slow start in her career'*. She admitted early on she '*clearly looked the part'* referring to psychophysiological characteristics of a *'slim and fragile ballerina appearance'*. However *'when it came to delivering major roles'* with the required strength she *'did not know how to handle* [her] *abilities'*. They reflected on the start of their careers recalling that an experienced mentor with similar physicality would have made their climb through the ranks and associated roles smoother. Bella spoke about her flexibility as an 'aesthetic' asset however; she believed that it was *'much harder to perform classical ballet with that asset'*. Sadly, all

but one dancer had received or actively sought out help. Overall, their openness to the physicality of their body type was limited to positive aesthetic attributes and negative physical weaknesses.

Concerning psychological challenges across their careers, the dancers all discussed feelings of being '*overwhelmed, obsessive in their thoughts*' at times, '*over-anxious*' and generally '*not coping with stressful situations*'. None of the other dancers associated these challenges with their body type. Two of the dancers had suffered from severe depression and anxiety, and received clinical help; however, associations with body type (GJH) were not established. Indeed, when the work of Baeza-Valesco and Bulbena connecting psychological and social issues and a GJH body type was discussed (Baeza-Velasco et al. 2018a, 2017, 2018b; Gurer et al. 2010) there was a strong consensus of disbelief and doubt.

Theme 2: managing GJH

One dancer managed the GJH by taking on-board additional support and advice given about the physical characteristics of GJH during his training. Three further received advice and information about extreme flexibility while they were seeing physical practitioners (physiotherapists, osteopaths, giro-tonic practitioners) for injury and related musculoskeletal weaknesses. The practitioners addressed the issues yet only ever referred implicitly to their flexibility as inherent. The reluctance of practitioners to name or 'label' the dancers with GJH or any other form of HSD is interesting; also encountered when the researchers initially contacted clinicians for dancer recruitment to the study. The rationale remains unclear; perhaps suggesting deliberate or inadvertent attitudes of 'if something has no name then it cannot become significant or at worst does not exist'.

Despite the lack of direction, the dancers managed to work 'with and around' the physicality of their 'inherently' flexible bodies. Using the extra range of motion for aesthetic and choreographic gains had come at a cost of pain and injury to some, which they considered normal in dance. Interestingly, all the dancers preferred to dance solo. Of course, the reason may be that the attention of the audience (and choreographer) focuses on a solo performer. However, some explained that it was difficult to 'contain' and co-ordinate exact movements with other dancers that did not have the same capacity for motion as them. This was '*really hard*' (Elsi) because of a lack of sense of where '[She] *and* [her] *body parts were in space*'. Aiden described formation work *as 'something that needed persistence and a lot of extra focus'. Pas de deux* challenges were discussed, and worryingly, Liz explained the criticism received in serious partner work, feeling: '[T]*oo floppy, like you are too heavy in his arms, it can be very personal getting these comments and corrections, to the point that you begin to feel that you are too heavy and desperately need to lose weight*'. For the men, challenges of shoulder joint range were '*dislocations and injury*' through lifting.

The biggest challenge to all of the dancers was '*managing stillness*'. Physical stillness is an important and necessary part of a dance performance providing contrasts with the complex dynamics of the choreography. The dancers referred to this in a range of contexts, for example, the more experienced dancers discussed how they had learned to deal with both physical and mental '*restlessness*' over time. Some had help from experienced practitioners or somatic practices. Bella described the physical discomfort '*I cannot stay still at all, I need to shake them* [her legs] *out regularly*' finding initial

comfort by 'siting' into her natural hyperextension, this also became painful after time. Elsi discussed an inability to sit at all because of aches and pains she experienced in her body. Liz felt physically ill when remaining motionless for any length of time requiring extra effort and concentration to hold a pose, which was exhausting, despite the fact that the stillness was designed to give her time to catch breath to continue the choreography. Ron told us he had latterly changed to a standing desk that allowed him to move around because he found sitting for any amount of time painful. Mental stillness was a real challenge and is discussed in terms of agitation, mood swings and difficulty in switching off. Bella, particularly when she was tired, needed to focus and concentrate hard in order to get things right, ruminating becoming *'obsessive and compulsive in* [her] *thoughts'*. Tom, in times of stress and anxiety, '*. . . my brain goes faster than my mouth'*. Mark spoke of the peaks and troughs in states of minds when he was under pressure and in particular when on tour and in unknown environments. Gill was obsessed with doing her best, using self-punishment for not working 110% all of the time. This, she knew, resulted in swings of mood that she had learned to cope with over the years. Ron likewise disclosed that his depression related to the fatigue that he felt daily and this caused anxiety. Elsi also described how she needed to *'be in control'* in order not to feel stressed, her obsession with control at times also made her feel exhausted. Many of the annotations made by the dancers are also observations reported in the GJH literature (Baeza-Velasco et al. 2018a; Baeza-Velasco, Grahame, and Bravo 2017; Pasquini et al. 2014).

When asked about managing new works or movement styles, all of the dancers referred to preferred ways of learning and described needing to understand the 'bigger picture' before working on the detail. Characteristic was their need to be aware of the orientation and pattern of the work before they could add any technical detail and the dancers knew they required more time compared to others to grasp and retain complex and/or lengthy choreographic works. Elsi interestingly used the rhythm of a movement in order to remember it, '[not] *following verbal instruction well . . . if people give me instructions and directions at the same time, I get stressed and cannot remember anything'*. She disclosed that even though she was now an experienced dancer she still had to go away and practice repetitively more than anyone else in the group in order to avoid getting anxious and stressed. Aiden knew he had to concentrate hard to retain new choreography, harder than other dancers he felt. Bella's capacity to retain choreography depended totally on the choreographer's or ballet master's style of delivery. If all of the choreographic information was given at once, '[her] *body could not cope'*, this meant spending extra time and energy correcting and filling in the details '*. . . like correcting and changing basically whatever your body remembers'*. Ron also described how he preferred to *'get the wash of a sequence of movement'* then he could *'find the details afterwards'*. Only when the dancers spent time and extra effort were they in command of the choreography, if they did not they could find themselves *'disorientated and lost on stage'* (Aiden).

The ballet masters

First, we considered the interview responses using the two themes and corresponding sub themes that emerge; these are interrelated and of equal significance.

Theme 1: the 'hypermobile aesthetic'

All Ballet masters were readily able to describe the biological markers, features and attributes associated with GJH, yet they referred to it not as a 'body type' but as an 'aesthetic'. Michael stated that in the company where he worked, the directorate actively sought out and had developed a 'taste' for the 'hypermobile aesthetic' and in particular the hypermobile dancers who mainly came from the Eastern-bloc (referring to the former Communist states of Eastern and Central Europe). He believed that extreme flexibility was a prerequisite for entrance in to the conservatoires and state schools in this area. He remarked that today the aesthetic preference for extension has shifted to over-extension *'the splits are no longer 180 degrees but easily 200 degrees'*. He confirmed that: *'90% of* [the company] *dancers are hypermobile, the others, are the minority, yes'*. Carolyn discussed a trend for the 'cultivation' of this type of dancer in companies; she could not quite understand it because they are *'so much harder to train'*. As a practitioner, she referred to the known weaknesses and imbalances of strength and flexibility, lack of proprioception, and other physical vulnerabilities associated with GJH. She added that this aesthetic was currently *'the norm'* in St. Petersburg and a trend in some European companies such as the Paris Opera. Commenting on a reality '*dancers are just all basically hypermobile'* because companies were now actively only seeking out dancers with a body type and physiognomy that is able to produce this 'choreographic spectacle'. Jean discussed a shift away from classical aesthetic and repertoire where, to her mind, a 'hypermobile aesthetic' was detrimental to the true *'alignment of the classical technique'* where the expressivity was within the classical vocabulary. She blamed the choreographic aesthetic of the neo-classical style that we now associate with Balanchine and his fascination with the body and its movement in three-dimensional space (Ritenburg 2010). She strongly believed that the 'Balanchine body' indeed advanced the 'hypermobile aesthetic' and remains a feature and ability that choreographers seek out, *'choreographers demand it . . . they encourage and want to choreograph in a way that extends mobility to its nth degree'*. To her mind '*it is brutal, I fear that sometimes the dancers will pay the price of exactly what this choreography is asking of them'*. Michael thought that today's hypermobile dancers had a poor understanding of their craft, struggling to maintain the classical line and aesthetic awareness of a classical technique. They *'kick their legs'* and expose an angle of the body that *'you don't want to show and see in classical ballet'*.

There was agreement that, from a physical perspective, a hypermobile aesthetic was associated with and could also be recognised through weakness, in the hamstrings and shoulder blades, and that a 'poor aesthetic' and 'winging' for the back was characteristic of this. The Ballet masters all made comment on the fact that the winging and associated weaknesses frequently caused technical problems and poor aesthetic in the arms, often (but not always) a lack of dynamics, and poor jumping capacity. Janis specified that dancers with this aesthetic have, weak spines, often even scoliosis and a tendency to appear very thin and '*lacking in muscle tone'*, which in turn she believed meant that they were often '*incorrectly "branded" as anorexic'*.

The Ballet masters recognised that the trend for a hypermobile aesthetic was constrained by the current taste and culture in dance. Borrowed from theatre and cinematography, this (*mise-en-scène*), used the body as a design and composition prop to create the visual theme of the work as opposed to the more traditional mimetic expression and

'narrative or story'. The Ballet masters discussed these choreographic practices citing, for example, works by Forsythe, Maliphante and McGregor who '*regularly seek to use dancers with this aesthetic to make and perform their work*' (Jean). The dancers are props who ' . . . *do not have* [bodily] *intelligence*' meaning that they are unable to differentiate between the styles and demonstrate technical nuances within their range of movement. They agreed and recognised that the development of the current hypermobile aesthetic within the realms of classical ballet related to choices largely driven by policy, strategy, the need to please audiences, fill theatres and ultimately satisfy the funders. Typically, states or governments who fund dance via arts bodies, increasingly influence programming in theatres and therefore choreographic and aesthetic choices (Burns and Harrison 2009). The Ballet masters confirmed that this strategy was ultimately influencing current aesthetic trends and demands in the dance environment. There was also a strong consensus that freely available digital platforms on social media had significant roles to play in this phenomenon. Less experienced audiences and dancers are obsessed on still images and video clips of dancers achieving the impossible *'fixated on aiming at the best possible photograph, or what they think is the best possible photograph to put on social media, and they forget that dance is about movement'* (Janis). All agreed that this type of fixation meant that young dancers no longer consider the meaning, artistry, artistic communication and expression within the performance, and their concerns were solely with the physical aspects of the work.

Theme 2: values and preconceptions

Conferring the asset-liability debate around the physical aspects of GJH (Castori and Colombi 2015; Foley and Bird 2013; Grahame and Jenkins 1972; Rietveld 2013), consensus was that natural flexibility was more complex that the specific yet very current 'aesthetic or look'. They valued it to different degrees and expressed individual views and preconceptions. They also discussed associated opposing views of professionals such as directors, teachers, coaches and the dancers themselves in relationship to the value of this specific aesthetic within dance performance. Janis described hyperextension as *'beautiful'*. However, she also iterated the important value of correct training and application of capacity fittingly and in line with the appropriate style of choreography. Carolyn discussed funders' pre-conceptions that theatres and ballet companies could put up programmes with very little rehearsal time which, ' . . . *ideally need dancers who have the natural physical capacity, are very fast at creating and absorbing new work . . . and who are less prone to injury'*. Carolyn was clearly unaware of the dancers' psychosocial stress in this process, she did however question the preconceptions and pedagogical role of a dance teacher when influencing a dancer's career choice, commenting how further research and consequently a clearer understanding of this aesthetic capacity may influence a company directorate's choices and professional values in the future. Indeed, she discussed a recent shift within New York City Ballet towards dancers who have a more athletic aesthetic and *'less curved and bendy legs'*. Janis referred to how values, preconceptions, pedagogy and intellectual curiosity play a role in the 'hypermobile aesthetic' and current trends. She discussed the lack of pedagogy (teacher-led direction) within current dance training to guide young dancers to discover *'what the different styles of dance mean even within classical ballet'*, suggesting that classical repertoire is increasingly now all perceived the same way.

The Ballet masters agreed that correct teaching and knowledge could provide the right information to support and work properly with GJH. Jean referred repeatedly to the 'intelligence' of dancers with a hypermobile aesthetic; some '*. . . would genuinely have you believe that they are working hard*'. Indeed, she believed that they were but needed to '*let go of the working hard and work more with their intelligence, curiosity for artistry, and creativity*'.

Jean believed that dancers with this aesthetic needed knowledge and information to support the extreme ranges of motion in technique as the starting point or base line. '[D]*ancers can develop a fixation . . . and need to learn to either 'disguise* it' [i.e. the hypermobility] or *let go of the fixation at that level of performance if they were ever to tread where angels fear to go*". Her observations confer the fixations and obsessions that the dancers discussed and also those previously reported in the literature (Pasquini et al. 2014). She believed that if this aesthetic was professionally valued as 'the thing or *it*', it would quickly propel the dancer forward in their career, yet the dancer would be weakened intellectually and emotionally. She also believed that some hypermobile dancers put too much value on their ability to hyperextend and they exploit '*it*' as they believe today's choreographers want it. She goes on to explain that if dancers really want to translate that 'language' (referring to the technique of aesthetic communication) perfectly and beautifully and correctly then they should not distort their bodies in that way. Emotionally today's dancers are *'in a quandary'* (Jean). In agreement with this, Janis suggested that dancers with this aesthetic are chosen for their extra ordinary physique and not the burning desire, passion and intrinsic need to become a dancer.

Finally, when asked to comment on the mental wellbeing of the dancers with this aesthetic that they worked with, no-one had ever considered there may be commonalities. Janis thought this was *'very far-fetched; sorry!'* However, when discussions shifted away from the physical manifestation of extreme body postures and gestures, they all noted fixations, passion, excessiveness, coping (or not), emotions and resilience. Jean referred to the difficulties in understanding how to control their bodies when learning work because the dancers were *'far too impatient'*. Carolyn also discussed less experienced dancers with this aesthetic as having *'a tendency to be emotionally insecure and hold back'*. An example she gave was placing them on an instable surface to improve proprioception '*. . . these are very skilled dancers and surely should be able to cope with that!*' Insecurity and lack of resilience in dancers with a hypermobile aesthetic was also discussed in terms of companies recruiting younger 'more physically able' dancers. One company of eighty dancers (the majority of which met the hypermobile aesthetic) had only five dancers over the age of twenty-five, and were according to Carolyn *'socially and emotionally lost. 30 years ago we did not have the same exposure to hypermobile dances'*. She described them as emotionally insecure, demonstrating *'a tense fear factor'* in their demeanour and posture. This may result from posture commonly associated with the restraints of a classical ballet technique (Smith 2009). It may also attribute to observations in GJH (Mccormack et al. 2004) where altered and ineffective motor patterns recruit in an attempt to stabilise the trunk (Simmonds and Keer 2008; Soper et al. 2015). As such, the focus is on muscle recruitment in the gesture limb compensates for postural instability using force and tension in the core (Karin 2016).

Summary and implications for dance practice

Our research asked about the dancers' and Ballet masters' knowledge and understanding of GJH within the context of their practice. Understanding for both the dancers (including the dancer that had been diagnosed at an early age) and the Ballet master was predominantly experiential, tacit and not explicit. This suggests that their knowledge of GJH in terms of the biopsychosocial and health risk is somewhat incomplete and, given the prevalence of GJH in dance, this is worrying. It is however really not surprising, as it is only relatively recently that the spectrum of disorders (HSD) to which GJH belongs have been categorised and, as a result, better defined in the clinical context (Malfait et al. 2017). Our research shows that managing and coping with the lived physicality of GJH had, over time, led the dancers to a tacit understanding of how to exploit their flexibility and range of motion for creative and choreographic gains. The dancers had also learned to manage the associated challenges of pain, weakness, injury, dislocations and sprains, and difficulties faced to enable partner work; their understanding towards the cost of these challenges was not explicit. The Ballet masters in this study also clearly understood the observable physical features of GJH and were able to discuss these at differing levels within a dance context. However, this research also propositions that entangled within the Ballet masters' understanding of GJH are 'perception' and 'tacit knowledge' that only come with many years of personal experience. At the same time, descriptive psychosocial implications of GJH such as emotional and mental wellbeing are slowly appearing in the literature (Baeza-Velasco et al. 2011; Baeza-Velasco et al., 2017); however, the dancers in this study had not made any such connections. That said, they had devised coping strategies; sadly; nevertheless, this was again over time and across careers, and for some perhaps too late. The Ballet masters observed and discussed the dancers' need to please, feel desired, accepted and wanted which suggests a tacit understanding of some of the social and emotional consequences of GJH in the dance environment. Indeed, acceptance and trust also emerged within the Ballet master's narratives in our study, similarly the role of relationships within GJH alongside the importance of trust, feeling safe and being accepted features in the hypermobility literature (Clark and Knight 2017; Knight 2013). Yet, the Ballet masters' understanding of the role of GJH in this was again not explicit and they were seemingly unaware of any connections between mental and emotional health and GJH.

As in professional dance, GJH is unavoidably prevalent in developmental and vocational settings where young dancers spend intensive periods of training with their teachers (McCormack et al., 2004; Schmidt et al. 2017). It is encouraging to see that some of the more recent professional learning for dance teachers includes generic advice about extreme flexibility with regard to control of the body and safe practice (e.g. Royal Academy of Dance, Imperial Society of Teachers of Dancing, OneDance UK). This has yet to become common practice nonetheless across what remains largely an unregulated domain. That said, the formative years for technical dance training can provide an ideal environment for the development of productive pedagogical teacher/dancer relationships and the development of trust that associates with positive psychosocial skills and resilience for a dancer (Stark and Newton 2014). In these, trusting pedagogical relationships there is therefore potential to facilitate the ideal safe environment for young dancers to learn about and understand how to manage and cope with GJH. We therefore propose

that if this is to happen, dance teachers themselves need to know more, and be confident about, their understanding of the biopsychosocial characteristics and the applied implications of GJH.

On a final note, we feel the necessity to also raise a concern of genuine significance relating to injury and *'duty of care'* which has indeed become known within music performance. This is evidenced in a court ruling that was successfully upheld in favour of a violinist who suffered a career ending injury to his hearing due to injurious noise exposure during a rehearsal (Goldscheider v Royal Opera House Covent Garden Foundation 2019 EWCA Civ 711). Surely, then a dancer may similarly sue a dance company or school for their negligence in encouraging choreographers, Ballet masters and teachers to exploit fragile bodies, exposing them to risk of injury resulting in long-term damage, let alone psychological issues. In which case, we conclude that not only dancers but also their employers and the choreographers must be made aware of and focus on the potential risks of exploiting a dancer's unique range of motion, which is becoming a significant problem in terms of contemporary aesthetics and practices in dance.

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No potential conflict of interest was reported by the authors.

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